

REMARKS

The Examiner's comments together with the cited references have been carefully studied. Favorable reconsideration in view of the foregoing amendments and following remarks is respectfully requested.

Claims 1-20 are pending in the application. Claims 1-20 have been rejected. Claim 2 has been canceled. Claims 1, 3, 7, 8, 9, 11, 12, 19, and 20 herewith are amended. Claims presently active are claims 1 and 3 to 20. Favorable reconsideration of the application in view of the following remarks is respectfully requested.

Claim 1 has been amended to recite that A, B, C and D are independently selected "from the group consisting of methylene, oxygen, carbonyl, mono-substituted nitrogen (N-R), and di-substituted carbon (R₁-C-R₂), wherein R, R₁ and R₂ are independently hydrogen or a substituent and any two R, R₁ and R₂ groups on the same ring in said structure can optionally form a fused ring" and that the R_{CO} groups are independently is "aryl, alkyl, cycloalkyl, alkaryl or heterocyclic, all either substituted or unsubstituted." Support for these amendments is to be found in original dependent claims 2 and 9. The structure in claim 1 has been amended as supported in claim 8 as well as page 16, lines 3-4, of the original specification.

Claims 19 and 20 have been rejected under 35 U.S.C. §101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. §101.

Claims 19 and 20 have been amended to recite that the chiral compound is admixed with a liquid crystal material to obtain a liquid crystalline composition. Claim 20 further recites that the liquid crystalline composition is disposed between first and second electrodes in a display. Support for these amendments is to be found in the original claims.

Claims 19 and 20 have been rejected under 35 U.S.C. §112, first paragraph. The Examiner states that the specification does not enable any person skilled in the art...to make and use the invention commensurate in scope with these claims." In particular, the Examiner states that there are no teachings how to make the rings containing oxygen and nitrogen-oxygen,

nitrogens, sulfur(s), sulfonyl and carbonyl groups, and only methylene and oxygen groups are exemplified in the specification.

The rejection is respectfully traversed. Applicants have amended the claims to recite that the A, B, C and D groups in the claimed structure are independently selected from the group consisting of methylene, oxygen, carbonyl, mono-substituted nitrogen (N-R), and di-substituted carbon (R₁-C-R₂). These amendments are deemed to now conform the claims to the requirements of the rules. It is submitted that a person skilled in the art is enabled, based on the examples in the specification, to make analogous compounds in which methylene and oxygen groups are replaced by carbonyl substituted nitrogen, by using suitable synthetic methods conventionally known. For example, carbonyls could be obtained via radical bromination and hydrolysis of a methylene. The nitrogen-containing ring could be obtained, for example, by starting with an NH₂ group on the Ar in intermediate 3 (Int-3) in the reaction Scheme 1 on page 20 of the present specification. As shown in Tables 1, 2, and 3, Applicants have synthesized and tested numerous compounds on which to reasonably base the claimed scope of the invention.

Relying on 35 U.S.C. §102(b), the Examiner has rejected claims 1-11 as being anticipated by Birman et al. The Examiner states that the reference discloses chiral 1,1-spirobiindane derivatives represented by formulae 4, 6-7, rac-16 and 20a-20b that anticipate the invention.

Applicants respectfully traverse the Examiner's rejection, and request reconsideration. Applicants respectfully submit that a rejection for lack of novelty under Section §102(b) requires that the invention must be identically disclosed or described in the reference. Furthermore, Applicants respectfully submit that important and material limitations of their invention as claimed are not disclosed in the reference.

In particular, in structure 4 of Birman et al., the oxygen is not in the place required by the present claims, i.e., it is not adjacent the spiro ring and it is not even attached to the phenyl ring. In structures 6 and 7, again the oxygens are in the wrong place. Applicants have discovered that the specific location of the oxygens shown in the structure of claim 1 is necessary for effective dopant activity. Moreover, claim 1 requires that the oxygens be

capped with a substituent, not merely hydrogen. Similarly, Applicants have found that hydrogen on the oxygens result in a significantly decrease in dopant activity. Regarding rac-16, again, the oxygens are not capped with a substituent. Furthermore, claim 1, requires that the oxygen be capped by a $-(C=O)R_{CO}$ group, which is not remotely taught or suggested by Birman et al. The oxygens attached to the ring in compound 20a-b of Birman et al. are not capped by a $-(C=O)R_{CO}$ group in which, the R_{CO} groups are independently substituted or unsubstituted aryl, alkyl, cycloalkyl, alkaryl or heterocyclic, which substitution has been shown, in the present examples, to provide effective chiral dopants for liquid crystalline compositions.

Claim 12 requires that the claimed compound be used as a chiral dopant in a liquid crystalline composition. The compounds of Birman are not disclosed to be useful as chiral dopants, but rather as auxiliaries and ligands for synthetic synthesis. In fact, Birman et al. make no mention of dopants for liquid crystal materials. For example, the compound 20a-20b of Birman et al. is used only as a synthetic intermediate.

Applicants therefore respectfully request that the Examiner reconsider and withdraw the rejection of the claims under 35 U.S.C. §102(b).

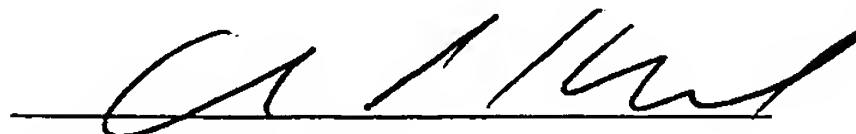
Applicants have reviewed the prior art made of record and believe that singly or in any suitable combination, they do not render Applicants' claimed invention unpatentable.

In view of the foregoing remarks and amendment, the claims are now believed allowable and such favorable action is courteously solicited.

Should the Examiner consider that additional amendments are necessary to place the application in condition for allowance, the favor is requested of a telephone call to the undersigned counsel for the purpose of discussing such amendments.

Respectfully submitted,

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